APPLICANT INITIATED INTERVIEW REQUEST

Applicant's representative respectfully requests a personal interview with Examiner Roberta A. Shand, Art Unit 2665, in the above mentioned application in accordance with M.P.E.P. § 713.01(III), to discuss the Remarks set forth below, at the Examiner's earliest convenience.

Examiner Shand kindly is requested to contact the undersigned attorney at the local telephone number listed below (or at Applicant's representative's direct number at 703-761-7623) to arrange for the personal interview at the Examiner's earliest convenience.

REMARKS

Claims 1-27 are all the claims presently pending in the application.

Applicant gratefully acknowledges that **claims 11-16 and 23-27** are **allowed**.

However, for the reasons set forth below, Applicant respectfully submits that all of the claims are allowable over the prior art of record.

Applicant notes that allowable claims 11-16 and 23-27 have been amended merely to make editorial changes in conformance with U.S. Patent practice. Claims 1-5, 7, 9, 18, 19, 21, and 22 also have been amended merely to make editorial changes in conformance with U.S. Patent practice. No new matter is added.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1-10 and 17-19 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Lewin (U.S. 6829253 B1).

Claims 20-22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Lewin in view of Ferguson (U.S. Patent Publication No. 2002/0059424 A1).

I. THE CLAIMED INVENTION

In conventional systems and methods, an apparatus (e.g., a PPP termination apparatus 50l as illustrated in Figure 19) which discriminates each subscriber who tries to access the Internet and has a function for ATM processing must be installed at an entrance to the backbone network 60l. Such an apparatus must be added every time the number of subscribers increases. In addition, the PPP termination apparatus 50l is often installed near the backbone network 60l to which packets from many subscribers are sent upon multiplexing (e.g., see specification at page 6, lines 7-16).

According to the conventional access network system, for example, as shown in Figure 19, since the overall access network system is formed by using the AAL5 layer, the overall system inevitably becomes complicated.

Also, in the conventional methods, as the number of subscribers who access the Internet increases, an apparatus for performing PPP processing as processing indispensable to connection of the subscribers to the backbone network of the Internet must be added. Such an apparatus may be installed in a place as near to the subscribers as possible, i.e., in an apparatus for providing Internet services (e.g., the ATM SW 40n in Fig. 19). In this case, it is required to avoid complication of PPP, complication of its system, complication of a management system for the system, and the like (e.g., see specification at page 6, lines 17-27, and page 7, lines 1-4).

The claimed invention, on the other hand, provides a multiplexing method and apparatus, demultiplexing method and apparatus, access network system, subscriber multiplexing/demultiplexing apparatus, and protocol termination apparatus which can multiplex PPP packets on the basis of MAC addresses and the like, demultiplex the packets on the basis of MAC or IP addresses, and simplify an arrangement for PPP processing by using these multiplexing and demultiplexing processes (e.g., see specification at page 7, lines 6-16).

Thus, according to one exemplary aspect of the claimed invention described in the specification (all reference numerals herein being used for the Examiner's clarity only and not for limiting the claims), the subscriber multiplexing/demultiplexing apparatuses 4n can multiplex Ethernet/IEEE 802.3 frame packets from the respective subscriber apparatuses 2nm on the basis of the MAC addresses, output the resultant signal as an Ethernet/IEEE 802.3 signal, and output each Ethernet/IEEE 802.3 frame packet in the Ethernet/IEEE 802.3 signal. The subscriber multiplexing/demultiplexing apparatuses 4n can also demultiplex an Ethernet/IEEE 802.3 frame packet from the access gateway 61 on the basis of the MAC address.

In addition, processing in each subscriber apparatus 2nm, each subscriber multiplexing/demultiplexing apparatuses 4n, and access gateway 61 can be performed by using MAC addresses, and the AAL5 layer required in the prior art is *not* required. The exemplary aspects of the claimed invention also make it possible to eliminate the necessity of an ATM switch in the conventional methods and systems, thereby simplifying the system arrangement. Thus, under this system simplification, QoS of each subscriber can be ensured (e.g., see specification at page 30, lines 20-27, and page 31, lines 1-12).

For example, independent claim 1 exemplarily defines, *inter alia*, a multiplexing method of multiplexing communication signals from communication signal transmitting sections and transmitting a multiplexed signal to a multiplexed signal receiving section, including adding, to each of the communication signals, an identification address preassigned to a predetermined signal identifying section through which a communication signal passes in a multiplexing system including the communication signal transmitting section and the multiplexed signal receiving section and outputting each of the communication signals, extracting the identification address from each output signal, and multiplexing the respective communication signals on the basis of the extracted identification addresses.

Somewhat similarly, independent claim 3 exemplarily defines, *inter alia*, a demultiplexing method, including adding, to each of the communication signals, an identification address preassigned to a predetermined signal identifying section through which a communication signal passes in a multiplexing system including the multiplexed signal transmitting section and the communication signal receiving section, and outputting each of the communication signals, extracting the identification address from the output signal, and demultiplexing the multiplexed signal for each of the communication signals on the basis of the extracted identification address.

Independent claim 5 exemplarily defines, *inter alia*, a demultiplexing method of demultiplexing a multiplexed signal obtained by multiplexing a plurality of packets into packets, including extracting an IP address from each packet in the received multiplexed signal, and demultiplexing the multiplexed signal into PPP packets on the basis of the extracted IP addresses.

Independent claim 6 exemplarily defines, *inter alia*, a multiplexing apparatus including address extracting means for extracting an identification address, for each communication signal, which is added to the communication signal received from each of the communication paths and preassigned to a predetermined signal identifying section through which the communication signal passes in a multiplexing system including the communication signal transmitting section and the multiplexed signal receiving section, and multiplexing means for multiplexing the communication signals received from the respective communication paths on the basis of the identification addresses set for the respective communication signals extracted by the address extracting means.

Independent claim 6 exemplarily defines, *inter alia*, a demultiplexing apparatus including address extracting means, connected to the multiplex communication path, for extracting an identification address, for each of the communication signals, which is added to each of the communication signals in the multiplexed signal received from the multiplex communication path and preassigned to a predetermined signal identifying section through which a communication signal passes in a demultiplexing section including the multiplexed signal transmitting section and the communication signal receiving section, and demultiplexing means for demultiplexing the multiplexed signal into the respective communication signals on the basis of the identification addresses of the respective communication signals which are extracted by the address extracting means.

Independent claim 8 exemplarily defines, *inter alia*, a demultiplexing apparatus including address extracting means, connected to the multiplex communication path, for extracting an IP address of each packet in the multiplexed signal received from the multiplex communication path, and demultiplexing means for demultiplexing the

multiplexed signal into the respective packets on the basis of the IP addresses of the respective packets extracted by the address extracting means.

Independent claim 17 exemplarily defines, *inter alia*, a multiplexing/demultiplexing apparatus including first address extracting means for extracting an identification address, for each of the communication signals, which is added to a communication signal received from each of the communication signal transmitting sections and preassigned to a predetermined signal identifying section through which the communication signal passes in a multiplexing system including the communication signal transmitting section and the multiplexed signal receiving section, multiplexing means for multiplexing the received communication signals on the basis of the identification address of each of the communication signals which is extracted by the first address extracting means, and transmitting the multiplexed signal to the multiplexed signal receiving section, second address extracting means for extracting an identification address, for each of the communication signals, which is added to each of the communication signals in the multiplexed signal received from the multiplexed signal transmitting section and preassigned to a predetermined signal identifying section through which a communication signal passes in a demultiplexing system including the multiplexed signal transmitting section and the communication signal receiving section, and demultiplexing means for demultiplexing the multiplexed signal into the respective communication signals on the basis of the identification addresses of the respective communication signals which are extracted by the second address extracting means, and transmitting demultiplexed communication signals to the communication signal receiving section.

Independent claim 20 exemplarily defines, *inter alia*, a multiplexing/demultiplexing apparatus including first receiving means provided for each subscriber apparatus and connected to a first communication path through which a packet output from the subscriber apparatus is transmitted, first transmitting means for transmitting a multiplexed signal to a first multiplex communication path, second receiving means connected to a second multiplex communication path through which a POS signal obtained by multiplexing packets addressed to the respective subscriber apparatuses is transmitted, and second transmitting means for transmitting each demultiplexed packet to a corresponding second communication path, including first address extracting means, connected to the first receiving means, for extracting a MAC address of each of the packets which is added to a packet received by the first receiving means, multiplexing means for multiplexing the packets received by the respective first receiving means on the basis of the MAC addresses of the respective packets which are extracted by the first address extracting means, and outputting the packet, second address extracting means, connected to the second receiving means, for extracting IP addresses of the respective packets from the packets in the POS signal received through the second receiving means, and demultiplexing means for demultiplexing each packet in the POS signal into the packets for the respective subscriber apparatuses on the basis of the IP addresses of the respective packets which are extracted by the second address extracting means, and outputting the packets to the second transmitting means.

II. THE PRIOR ART REJECTIONS

A. Claims 1-10 and 17-19 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Lewin.

The Examiner alleges that Lewin discloses all of the features of the claimed invention. Applicant respectfully submits, however, that there are features of the claimed invention which are not disclosed or suggested by Lewin. Therefore, Applicant traverses this rejection.

Particularly, the Examiner alleges that Figures 1 and 2 of Lewin (see also Lewin at column 4, line 46 to column 5, line 15) discloses all of the features of the claimed invention. Applicant respectfully disagrees with the Examiner's position, for the following reasons.

Independent claim 1

Independent claim 1 recites, *inter alia*, a multiplexing method, including:

> *adding, to each of the communication signals, an identification address preassigned to a predetermined signal identifying section through which a communication signal passes in a multiplexing system including the communication signal transmitting section and the multiplexed signal receiving section and outputting each of the communication signals;*
> *extracting the identification address from each output signal; and*
> *multiplexing the respective communication signals on the basis of the extracted identification addresses* (emphasis added).

That is, the claimed invention, can multiplex, for example, PPP packets on the basis of extracted identification addresses (e.g., MAC addresses and the like), thereby simplifying an arrangement for PPP processing (e.g., see specification at page 7, lines 6-16).

Thus, according to one exemplary aspect of the claimed invention, processing in each subscriber multiplexing apparatus can be performed by using extracted identification addresses (e.g., MAC addresses), such that the AAL5 layer required in the conventional methods is *not* required. The exemplary aspects of the claimed invention also make it

possible to eliminate the necessity of an ATM switch in the conventional methods and systems, thereby simplifying the system arrangement. Thus, under this system simplification, QoS of each subscriber can be ensured (e.g., see specification at page 30, lines 20-27, and page 31, lines 1-12).

In comparison, Applicant submits that Lewin does not disclose or suggest at least the claimed "*multiplexing the respective communication signals on the basis of the extracted identification addresses*" as defined by claim 1. That is, Lewin does not disclose, suggest, or even mention that the multiplexing is performed "*on the basis of the extracted identification addresses*" as defined by claim 1.

For the foregoing reasons, Applicant submits Lewin does not disclose or suggest all of the features of independent claim 1. Therefore, the Examiner is requested to reconsider and withdraw this rejection and to permit independent claim 1 (and dependent claim 2) to pass to immediate allowance.

Independent claim 3

Independent claim 3 recites, *inter alia*, a demultiplexing method, including:

> *adding, to each of the communication signals, an identification address preassigned to a predetermined signal identifying section through which a communication signal passes in a multiplexing system including the multiplexed signal transmitting section and the communication signal receiving section, and outputting each of the communication signals;*
>
> *extracting the identification address from the output signal; and*
>
> *demultiplexing the multiplexed signal for each of the communication signals on the basis of the extracted identification address (emphasis added).*

Applicant submits, however, that Lewin does not disclose or suggest at least the claimed "*demultiplexing the multiplexed signal for each of the communication signals on*

the basis of the extracted identification address" as defined by claim 3, for somewhat similar reasons as those set forth above.

For the foregoing reasons, Applicant submits Lewin does not disclose or suggest all of the features of independent claim 3. Therefore, the Examiner is requested to reconsider and withdraw this rejection and to permit independent claim 3 (and dependent claim 4) to pass to immediate allowance.

Independent claim 5

Independent claim 5 recites, *inter alia*, a demultiplexing method, including:

> *extracting an IP address from each packet in the received multiplexed signal; and*
> *demultiplexing the multiplexed signal into PPP packets on the basis of the extracted IP addresses (emphasis added).*

Applicant submits, however, that Lewin does not disclose or suggest at least the claimed "*demultiplexing the multiplexed signal into PPP packets on the basis of the extracted IP addresses*" as defined by claim 5, for somewhat similar reasons as those set forth above.

Independent claim 6

Independent claim 6 recites, *inter alia*, a multiplexing apparatus, including:

> *address extracting means for extracting an identification address, for each communication signal, which is added to the communication signal received from each of the communication paths and preassigned to a predetermined signal identifying section through which the communication signal passes in a multiplexing system including the communication signal transmitting section and the multiplexed signal receiving section; and*
> *multiplexing means for multiplexing the communication signals received from the respective communication paths on the basis of the identification addresses set for the respective communication signals extracted by said address extracting means* (emphasis added).

Applicant notes that independent claim 6 defines some of the features of the invention in "means-plus-function" language. The "means-plus-function" recitations properly should be construed as covering the specific arrangement of elements disclosed in the specification and drawings (and then "reasonable" equivalents under 35 U.S.C. § 112, sixth paragraph).

Applicant submits, however, that Lewin does not disclose or suggest any structure, equivalents thereof, or identity of function necessary for at least the claimed "*multiplexing means for multiplexing the communication signals received from the respective communication paths on the basis of the identification addresses set for the respective communication signals extracted by said address extracting means*" as defined by claim 6 and described in the specification, for somewhat similar reasons as those set forth above.

For the foregoing reasons, Applicant submits Lewin does not disclose or suggest all of the features of independent claim 6. Therefore, the Examiner is requested to reconsider and withdraw this rejection and to permit independent claim 6 (and dependent claim 7) to pass to immediate allowance.

Independent claim 8

Independent claim 8 recites, *inter alia*, a demultiplexing apparatus, including:

> *address extracting means, connected to the multiplex communication path, for extracting an identification address, for each of the communication signals, which is added to each of the communication signals in the multiplexed signal received from the multiplex communication path and preassigned to a predetermined signal identifying section through which a communication signal passes in a demultiplexing section including said multiplexed signal transmitting section and said communication signal receiving section; and*
>
> *demultiplexing means for demultiplexing the multiplexed signal into the respective communication signals on the basis of*

> *the identification addresses of the respective communication signals which are extracted by said address extracting means* (emphasis added).

Applicant notes that independent claim 8 defines some of the features of the invention in "means-plus-function" language. The "means-plus-function" recitations properly should be construed as covering the specific arrangement of elements disclosed in the specification and drawings (and then "reasonable" equivalents under 35 U.S.C. § 112, sixth paragraph).

Applicant submits, however, that Lewin does not disclose or suggest any structure, equivalents thereof, or identity of function necessary for at least the claimed "*demultiplexing means for demultiplexing the multiplexed signal into the respective communication signals on the basis of the identification addresses of the respective communication signals which are extracted by said address extracting means*" as defined by claim 8 and described in the specification, for somewhat similar reasons as those set forth above.

Therefore, the Examiner is requested to reconsider and withdraw this rejection and to permit independent claim 8 (and dependent claim 9) to pass to immediate allowance.

Independent claim 10

Independent claim 10 recites, *inter alia*, a demultiplexing apparatus, including:

> *address extracting means, connected to the multiplex communication path, for extracting an IP address of each packet in the multiplexed signal received from the multiplex communication path; and*
> *demultiplexing means for demultiplexing the multiplexed signal into the respective packets on the basis of the IP addresses of the respective packets extracted by said address extracting means* (emphasis added).

Applicant notes that independent claim 10 defines some of the features of the invention in "means-plus-function" language. The "means-plus-function" recitations properly should be construed as covering the specific arrangement of elements disclosed in the specification and drawings (and then "reasonable" equivalents under 35 U.S.C. § 112, sixth paragraph).

Applicant submits, however, that Lewin does not disclose or suggest any structure, equivalents thereof, or identity of function necessary for at least the claimed "*demultiplexing means for demultiplexing the multiplexed signal into the respective packets on the basis of the IP addresses of the respective packets extracted by said address extracting means*" as defined by claim 10 and described in the specification, for somewhat similar reasons as those set forth above.

Therefore, the Examiner is requested to reconsider and withdraw this rejection and to permit independent claim 10 to pass to immediate allowance.

Independent claim 17

Independent claim 17 recites, *inter alia*, a multiplexing/demultiplexing apparatus, including:

> *first address extracting means for extracting an identification address, for each of the communication signals, which is added to a communication signal received from each of said communication signal transmitting sections and preassigned to a predetermined signal identifying section through which the communication signal passes in a multiplexing system including said communication signal transmitting section and said multiplexed signal receiving section;*
>
> *multiplexing means for multiplexing the received communication signals on the basis of the identification address of each of the communication signals which is extracted by said first address extracting means, and transmitting the multiplexed signal to said multiplexed signal receiving section;*

> *second address extracting means for extracting an identification address, for each of the communication signals, which is added to each of the communication signals in the multiplexed signal received from said multiplexed signal transmitting section and preassigned to a predetermined signal identifying section through which a communication signal passes in a demultiplexing system including said multiplexed signal transmitting section and said communication signal receiving section; and*
>
> *demultiplexing means for demultiplexing the multiplexed signal into the respective communication signals on the basis of the identification addresses of the respective communication signals which are extracted by said second address extracting means, and transmitting demultiplexed communication signals to said communication signal receiving section* (emphasis added).

Applicant notes that independent claim 17 defines some of the features of the invention in "means-plus-function" language. The "means-plus-function" recitations properly should be construed as covering the specific arrangement of elements disclosed in the specification and drawings (and then "reasonable" equivalents under 35 U.S.C. § 112, sixth paragraph).

Applicant submits, however, that Lewin does not disclose or suggest any structure, equivalents thereof, or identity of function necessary for at least the claimed "*multiplexing means for multiplexing the received communication signals on the basis of the identification address of each of the communication signals which is extracted by said first address extracting means*" as defined by claim 17 and described in the specification, for somewhat similar reasons as those set forth above.

Also, Lewin does not disclose or suggest any structure, equivalents thereof, or identity of function necessary for at least the claimed "*demultiplexing means for demultiplexing the multiplexed signal into the respective communication signals on the basis of the identification addresses of the respective communication signals which are*

extracted by said second address extracting means, and transmitting demultiplexed communication signals to said communication signal receiving section" as defined by claim 17 and described in the specification, for somewhat similar reasons as those set forth above.

For the foregoing reasons, Lewin does not disclose or suggest all of the features of the claimed invention. Therefore, the Examiner is requested to reconsider and withdraw this rejection and to permit claims 1-10 and 17-19 to pass to immediate allowance.

B. Claims 20-22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Lewin in view of Ferguson.

The Examiner alleges that the combination of Lewin and Ferguson disclose or suggest all of the features of the claimed invention. Applicant respectfully submits, however, that there are features of the claimed invention which are not disclosed or suggested by Lewin and Ferguson, either individually or in combination. Therefore, Applicant traverses this rejection.

Independent claim 20

Independent claim 20 recites, *inter alia*, a multiplexing/demultiplexing apparatus, including:

> *first address extracting means, connected to said first receiving means, for extracting a MAC address of each of the packets which is added to a packet received by said first receiving means;*
>
> *multiplexing means for multiplexing the packets received by said respective first receiving means on the basis of the MAC addresses of the respective packets which are extracted by said first address extracting means, and outputting the packet;*
>
> *second address extracting means, connected to said second receiving means, for extracting IP addresses of the*

> *respective packets from the packets in the POS signal received through said second receiving means; and*
>
> *demultiplexing means for demultiplexing each packet in the POS signal into the packets for said respective subscriber apparatuses on the basis of the IP addresses of the respective packets which are extracted by said second address extracting means, and outputting the packets to said second transmitting means* (emphasis added).

With respect to claim 20, the Examiner acknowledges that Lewin does not disclose or suggest POS signals, as claimed.

However, the Examiner asserts that Ferguson makes up for the deficiencies of Lewin by disclosing POS (see Ferguson at paragraph 54). The Examiner alleges that it would have been obvious to adapt the POS of Ferguson to Lewin's system to use optical signals (e.g., see Office Action at page 4, numbered paragraphs 9-12).

Applicant notes that independent claim 20 defines some of the features of the invention in "means-plus-function" language. The "means-plus-function" recitations properly should be construed as covering the specific arrangement of elements disclosed in the specification and drawings (and then "reasonable" equivalents under 35 U.S.C. § 112, sixth paragraph).

Applicant submits, however, that Lewin does not disclose or suggest any structure, equivalents thereof, or identity of function necessary for at least the claimed "*multiplexing means for multiplexing the packets received by said respective first receiving means on the basis of the MAC addresses of the respective packets which are extracted by said first address extracting means*" as defined by claim 20 and described in the specification, for somewhat similar reasons as those set forth above with respect to independent claims 1, 3, 5, 6, 8, 10, and 17.

On the other hand, Ferguson does not make up for these deficiencies of Lewin, and indeed, is not relied upon for such teachings.

For the foregoing reasons, Lewin and Ferguson, either individually or in combination, do not disclose or suggest all of the features of the claimed invention. Therefore, the Examiner is requested to reconsider and withdraw this rejection and to permit claims 20-22 to pass to immediate allowance.

III. FORMAL MATTERS

A. Formal Drawings

The Examiner is requested to acknowledge receipt of and approve the formal drawings filed on January 18, 2002.

B. Priority under 35 U.S.C. § 119

Applicant also requests that the Examiner check Box 12(a)(1) of the Office Action Summary indicating that the certified copies of the priority document have been received.

C. IDS Form PTO 1449

Applicant notes that, for some reason, the Examiner has not initialed all of the references listed on the form PTO 1449's for the Information Disclosure Statements filed on August 11, 2004. Particularly, the Examiner did not initial JP 2002-64587 (filed February 28, 2002), which was cited on page 1 of 2 of the IDS.

Applicant notes that the Information Disclosure Statement fully complied with M.P.E.P. § 609 and 37 C.F.R. §§ 1.97-1.98. It was noted in the IDS that the references were cited in a Japanese Office Action in the counterpart application. In full compliance with M.P.E.P. § 609 and 37 C.F.R. §§ 1.97-1.98, a translation of the relevant portions indicating the degree of relevance of the Japanese Office Action, together with an

English-language Abstract for the JP 2002-64587 reference, was in fact submitted. Again, this is in full compliance with M.P.E.P. § 609 and 37 C.F.R. §§ 1.97-1.98.

Hence, the Examiner is requested to consider and initial all of the references cited on the PTO-1449 Forms for the Information Disclosure Statements filed on August 11, 2004, including the JP 2002-64587 reference. For the Examiner's convenience, a duplicate of page 1 of 2 of the PTO-1449 Form for the August 11, 2004 IDS is resubmitted herewith.

D. Specification

The specification is amended merely to correct minor spelling and grammatical errors.

IV. CONCLUSION

In view of the foregoing, Applicant submits that claims 1-27, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: JANUARY 5, 2006

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